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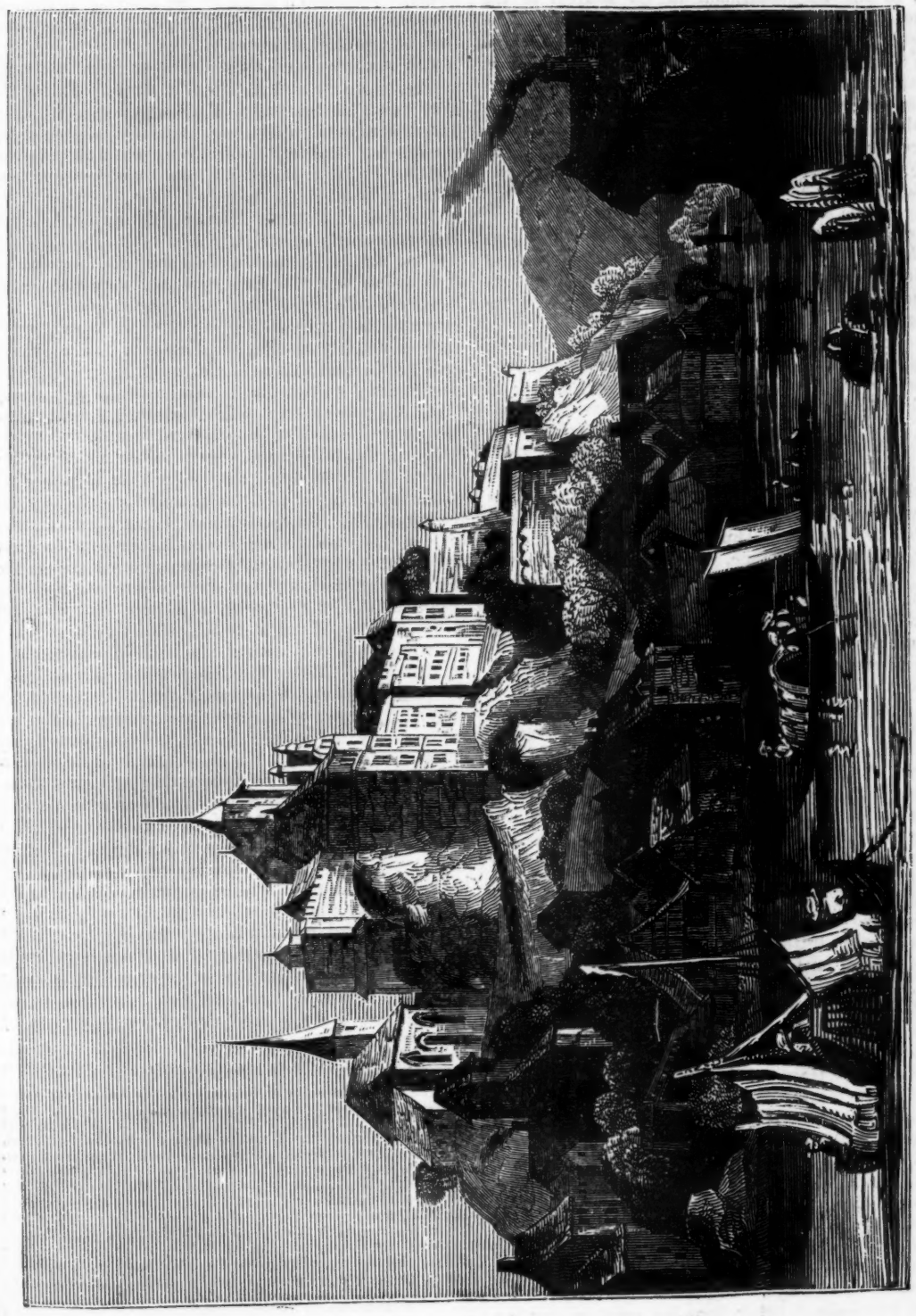

AARBURGH, ON THE AAR.

THE AAR, AND THE CANTON OF AARGAU, IN SWITZERLAND.

AARBURGH, ON THE AAR.

THE three letters *Aar* form the root of three or four terms connected with the geography of Switzerland. For instance: the *Aar* is a river: *Aargau* is the canton, district, or province, of the *Aar*: *Aarburg*, a town on the Aar, and so on.

The river Aar springs from the foot of the Finsteraarhorn mountain, in the canton of Berne, in Switzerland, in the neighbourhood of the sources of the Rhine, the Rhone, the Reuss, and the Tessin. The streamlet which ultimately forms the Aar is derived from a large mass of ice called the glacier of Aar, in the canton of Berne. The valley in which this glacier lies, is divided into two parts by a hill, in each of which parts is a mass of ice, which furnishes a source for water. The higher glacier, towards the south, gives birth to the upper branch of the Aar; and the lower glacier, towards the north, serves as the source of the lower Aar; and these two brooks or streamlets soon join and form the river Aar. It is an icy plain, with insulated pyramids of ice, and masses of granitic rock, strewed over its surface. These glaciers extend to a considerable distance, and have been described by Meyer, who travelled there in 1812.

The spring coming from the upper glacier is the principal; and after it has united itself with the Finsteraar and the Lauteraar, it assumes the name of the river Aar, which rushes down the various precipices in a picturesque manner: at one place it is rushing with a great noise, and precipitating itself over falls: then it flows more softly through a valley; and then enters the Brieuser-see. It then leaves the Brieuser-see, and flows into the Thuner-see; after which it flows close to Thun and Bern, and is here augmented by the Saone, which has run its course from the canton of Friburg. It then extends into two or three neighbouring cantons; and at length into that of Aargau, and washes the town of Aarburg, which is represented in our frontispiece. It then proceeds onwards in its course, varying its width according to the nature of the country through which it flows; being 500 feet wide at Aarau, the capital of Aargau, and only sixty-five feet near Bruck, where it flows through a rocky channel. After taking in the various smaller streams of the canton of Aargau, together with the Reuss, it finally discharges its collective waters into the mighty Rhine, at Coblentz.

The town of Aarburg, situated on the banks of the river which we have been describing, is an extremely small place, containing (according to an account written in Germany a few years ago) not much above fifty houses and twelve hundred inhabitants. There is a copper-foundry in the town, and the cotton-manufacture is carried on to a small extent. There is also a castle, or rather, a sort of town-hall, which was built in 1660, and was then appropriated as a state prison for the canton of Berne; and when Michael du Crest, a Genevan Mathematician, was confined here, in 1754, he lessened the tedium of imprisonment by measuring from his prison, the height of the beautiful snowy mountains, which were within his view:—an instance among the many that might be adduced, that a well-stored and an intelligent mind is never without some object which will tend to make time pass more agreeably than to him whose mental stores are limited.

The canton of Aargau, of which Aarburgh is one of the towns, is a pleasant district, diversified by hills, mountains, and valleys. It is situated in the northern part of Switzerland, being bounded by Germany, on the north, the cantons of Zurich and Zug, on the east, the canton of Lucerne, on the south, and those of Basle and Berne, on the west. It contains an area of about forty square miles: and is divided into a great many pleasant valleys. It has about a hundred and fifty thousand inhabitants, scattered over twelve towns and two hundred and seventy-one villages. The inhabitants are for the most part Protestants, the number of Catholics being somewhat smaller; while the Jews number about seventeen hundred, and inhabit two villages, but without possessing municipal rights. The canton is one of the most industrious of all those in Switzerland, and is more a manufacturing than an agricultural country.

The last compound word springing from the same source, which we may mention, is *Aarau*. This is the chief town in the canton of Aargau; and, like Aarburgh, is situated on the Aar. Our readers would frequently find that names of towns, ports, mountains, districts, &c., take their rise from some common term which is applied to them all. Let us take for instance Exe, Exmouth, Exeter, and Exmoor, all in Devonshire. The *Exe*, is a small river, which flows into the British Channel: the town which is situated at the point where it discharges itself into the sea, is *Exmouth:* the chief town, through or near which it passes in its course, is *Exeter:* and the high ground situated near its source, is *Exmoor* *. In a similar manner the words Aar, Aarau, Aarburg, and Aargau, are formed: if attention be paid to these apparently slight circumstances, it will often assist the reader in the comprehension of geographical details.

The town of Aarau, which is the chief in the canton, is situated on the south side of the Jura mountains. It is well built, and has about three thousand five hundred inhabitants, about equally divided between Catholics and Protestants. They are an intelligent class of people, and are engaged in silk, cotton, linen, and other manufactures.

One of the small towns in Aargau is *Baden*, not Baden Baden, known to English travellers as a watering-place, but one of a similar character on a smaller scale. When Mr. Inglis was there, he found a supper prepared, at the inn at which he stopped, for a wedding-party, which had come from Zurich to make merry at Baden, because *dancing is not permitted in the Canton of Zurich*, unless by special permission of the government; and this is almost always refused. In order that the pleasure of a dance may be enjoyed without incurring the penalties, a certain number of persons must sign a paper declaratory of their intention. This is handed to the council; and if the conservators of public morals in the canton of Zurich think the dance may be allowed, and the public preserved in purity notwithstanding, permission is accorded; but it is asserted a refusal is generally the result. Public balls are, however, permitted once a week at Baden.

Mr. Coxe gives a vivid description of the valley along which the river Aar flows. He says,—

The road along this valley, though much narrower than

* The modern term *Exeter* is a corruption of the ancient Saxon *Ex-cester*. The postfix Caster, Chester, &c., answers to the Saxon *Ceaster*, and to the Latin *Castrum*; meaning an encampment or fort; or a fortified town. The river Exe is the *Wisk* of the Britons, who called Exeter *Caerwisc*, that is, the town on the water or river. They gave the same name to the town now called *Usk*, in Monmouthshire, which also stands upon a river still called *Usk*; this is another corruption of the same original British term, from which the modern *Exe* and *Esk* have been formed; the latter of which gives a name to no less than five rivers in Scotland; *Ouse*, the name of four rivers in England; and *Ouche*, on which stands Dijon, the chief city of Burgundy. The same word forms the first syllable of the Irish *usquebaugh*, and the Scotch *whisky*, both of which signify *the water of life*, (in which many a man has been drowned!) To the same term may be referred *Hex*-ham, in Northumberland, and *Wex*-ford, in Ireland; so that the terms *Waterford* and *Wexford* are synonymous.

that from Altdorf to the St. Gothard, is formed in the same manner along the steep declivities and acclivities, sometimes laid on arches, and sometimes carried over bridges thrown across tremendous precipices. It is paved with flat pieces of granite, so smooth and slippery that the horses would have perpetually stumbled, had they not been rough shod. In some places this road ran along the bare and rugged ridges; in others, down steps either cut in the rock, or formed by large stones, so that for several paces it resembled a staircase. The whole surface of the valley was thickly strewed with vast fragments of rock, while those which still hung on the sides of the mountains seemed threatening to overwhelm us,—the river, during the whole way, thundering along in a continual fall. This valley exhibits the same kind of scenes to which we have long been accustomed, except that the Aar rushes with more impetuous rage even than the Rhone or the Reuss, and is frequently so swelled with torrents as to ravage all the adjacent country: we saw many traces of these terrible devastations. We crossed it in several places, over stone bridges of a single arch, one of which equalled in the length of its span and the dreariness of its landscape, the "Devil's Bridge," in the valley of Schoellenen. About three leagues from Spital we had a glimpse, through the trees, of the Aar falling from a considerable height. In order to gain a nearer view, we climbed along the sides of a steep rock well covered with moss; I leaned against a tree that impended over the precipice, and saw the river rushing from the rock, and spreading into a kind of semicircular expansion in its descent. It fell with fury into a deep and narrow gulf, and then lost itself in the depth of the forest. The body of water was very considerable, and its perpendicular fall at least one hundred and fifty feet. The scenery was also solemnly majestic; the gray rocks on each side rising perpendicularly, and totally bare, except their tops, which were fringed with pines.

Mr. Inglis informs us that throughout Aargau, farming out land is unknown, with the exception of gardens near the large towns. The properties of those who are considered respectable Swiss peasants (for all proprietors who are not noble are called peasants), run from ten up to forty, or at most fifty acres; and good land is considered to yield ten per cent. profit. Many of the peasants have amassed considerable fortunes: but accession of fortune is never made apparent in their mode of living. From 100*l.* to 300*l.* per annum is the usual range of expenditure for persons living in what we should call *easy* circumstances; and it is asserted that not a single individual in the whole of Switzerland spends one thousand pounds per annum. Transference of land is not usual in Aargau; but when it is brought to the market, thirty-six thousand square feet of good land will bring about fifty pounds sterling. All land pays one-tenth part of the produce to government in the name of taxes.

Aargau is now one of the confederate states of Switzerland, but it belonged formerly to Berne, Zurich, and Baden, and has only been independent since the year 1798. We have stated that the inhabitants consist of Catholics and Protestants in nearly equal numbers; and from this circumstance arises a law, by which its supreme council must consist of members of both religions in equal proportions.

STRENGTH OF HUMAN MUSCLES.

Robert François Damiens, who attempted the assassination of Louis the Fifteenth, in 1757, after suffering the most unheard of tortures, was sentenced to be drawn in quarters by four horses. But although they exerted their entire strength, by drawing in four directions upon his limbs, for *fifty minutes*, the muscles were not torn from their attachments; and being still alive, the executioners were obliged to cut the tendons with a knife, in order to answer the law, which was that the criminal's body should be drawn in quarters. Precisely the same course was resorted to in the case of Ravaillac, who assassinated Henry the Fourth, the horses being unable to dismember the criminal's body.

LUMINOUS APPEARANCE OF THE SEA.

II.

There are, as has been shown, many varieties of the *Medusa* enumerated, as possessing the property of lumination. I shall, however, confine myself to a notice of some of the most remarkable which inhabit the North American seas. The most common of these are the *Medusa pellucens* of Sir Joseph Banks, one of the varieties of which is frequently met with in Boston harbour, and is known by the name of sun-fish,—and the *Medusa noctiluca* of Forskal, which is about three inches in diameter, and in figure like a mushroom. These last are found in great numbers about the banks which border the American coasts, and their presence may be regarded as an indication of the approach to soundings. They are of a brownish colour, and have tentacula, like the *M. pellucens*, but thicker and shorter. Their margin is fringed in the same manner, to the depth of about three-eighths of an inch, and, together with the rays or ribs, resembles a wheel of light, which enlarges or diminishes, as the animal contracts or expands itself.

The former of these, the *M. pellucens*, is of an hemispherical form, and ordinarily about five inches in diameter, and the summit of the crown is marked by a circle about an inch and a half in diameter. This is divided into six equal compartments, by the intersection of three dark lines; and from the circumference of this circle to the margin of the animal, proceed a great number of radiations, of a purple or brown shade. The border is fringed by a small thread-like membrane, in the form of scallops, not unlike the gills of fishes, and perhaps answering a similar purpose. From this depend a great number of long tentacula, or feelers, which probably serve the purpose of securing their prey, by entangling it in their folds. From the centre of the interior is suspended a kind of bag, terminating in four or five finger-like points, which appear to be the stomach and viscera. The lustre proceeds chiefly from the crown and margin.

This creature's light is extremely brilliant, and the flashes are frequently so vivid as painfully to affect the eyes of one who looks at them for any length of time steadily. I have known the water to be so filled with them on the American coasts, after the prevalence of an easterly storm, that it was dangerous to run for the land in the night, owing to the difficulty of distinguishing the lights on the shore, from those in the water which were flashing round us in every direction. At another time, in a heavy gale from the N. E., in latitude 35°, between the Gulf-stream and soundings, I witnessed one of the most magnificent, yet awful scenes, that can be imagined. The night was very dark, with frequent lightning in the western quarter, but until about eleven o'clock, nothing unusual was observable in the appearance of the sea. About that time it began to grow luminous, and by midnight the spectacle was sublime beyond description. The lightning appeared to mingle with, and career along a waste of fire; and each successive shower of spray enveloped hull, and cordage, and canvass, in a sheet of lurid light. The extremities of the spars were glittering with luminous points, and the plies of the rigging were gemmed in the same manner: as these were driven from one place to another by the wind, they presented the appearance of sparks from a forge. The effect of the light on the countenance was unpleasant in the extreme, and even appalling. The faces of the crew had a distorted and unnatural air, and wore a green and ghastly look, similar to that sometimes produced on the stage in incantation-scenes. The

whole left an impression on my mind which will never be effaced.

During the prevalence of these phenomena the wind hauled to S. E.; in this quarter it remained about an hour, during which time the light was more vivid than at any other period of its continuance. By straining some of the water carefully through a fine cloth, I obtained a great number of small globules of a blueish colour, and the water was left lustreless. These globules were in general not larger than a pin's head; a few of them were about the size of a small pea, and of an oblong figure. It is probable that these were the variety spoken of by Mr. Macartney as the *Medusa scintillans*, as they were like those he describes, so transparent as scarcely to be perceived in the water; and, when held to the light, they appeared like small drops of that fluid. They also manifested a disposition to collect together on the surface, where they assumed a pale-yellow colour. Upon replacing a number of those on the cloth in their native element, no light was visible while it was tranquil; but on agitating the vessel which contained them, a brief bright flash was thrown out, in consequence of so many of the insects shining at the same instant, resembling the faint lightning of summer evenings. Besides these and several larger medusæ, there were numbers of the small shrimp, *Cancer fulgens*, which gave a very brilliant light, throwing out the flashes apparently at pleasure, and especially when suddenly disturbed. On rubbing these insects to pieces on the cloth, its appearance was similar to the phosphorescence produced by decaying fish; this, however, endured but a very short time.

At about two o'clock in the morning, the wind suddenly veered to the N. W., and in a brief space, nearly all the luminous particles had vanished. Whether this sudden disappearance was owing to a change in the atmosphere, or to some other cause, I cannot pretend to determine; but I have subsequently observed, that in every instance, where the sea was more than usually filled with these particles, the wind was in the eastern quarter.

Similar appearances have been recorded by a number of scientific travellers. M. de Riville, a member of the French Academy of Science, observed the sea during a night on the coast of Malabar, to assume the appearance of a field of snow. Cook and De la Pérouse, also, in the course of their voyages, mention its becoming of a bright straw-colour at times. Père Bourzes, a French clergyman, in his voyage to India, so long since as 1704, witnessed, what he termed, luminous vortices, which he states appeared and vanished at intervals, like flashes of lightning. Captain Horsburg informed Sir Joseph Banks, that there was a peculiar phenomenon visible in the Indian Ocean in the rainy season. One night, when the sea was very dark, it suddenly changed to a bright flame-colour, which continued about ten minutes. It bore no resemblance to the ordinary sparkling or glowing appearance, but was an equally-diffused milky light. The cause of this seems to be satisfactorily given in some remarks communicated by a gentleman to Mr. Macartney.

Between New Holland and the coast of China, shortly after sunset, every person on board was surprised at the milky appearance of the sea. It was imagined that they were upon a reef, and that the light was caused by the coral bottom. Upon sounding, however, no bottom was found with seventy fathoms of line. This gentleman examined a bucket of water in the dark, and detected the presence of a great quantity of globular bodies about the size of a pin's head, joined together, and emitting pale phosphoric light. These were so transparent that they could hardly be discerned, when taken in the hand into the light. This singular appearance was visible for two evenings. So soon as the moon rose, the sea resumed its usual dark appearance. These remarks are extremely important, as tending to prove that the diffused light of the ocean is caused by the concourse of a vast number of minute medusæ near the surface. These globules were undoubtedly to be referred to the variety *Medusa scintillans*, or sparkling medusa.

There is another singular phenomenon which may be traced to the same source, and has long been a fruitful subject for the superstitious terrors of the ignorant. There are few seamen probably, who have not felt a thrill of awe, an undefinable sensation of mingled fear and wonder, on beholding, during the violence of a tempest, a pale lambent flame hovering about the summit of the mast, or the extremities of the loftiest yards. This sensation is felt by almost every nation; and each has some legend of its portent, from the volatile Frenchman, who shrugs his shoulders in helplessness, at sight of the "Feu Saint Elme," or St. Elmo's torch, and the timid Portuguese or Spaniard, who devoutly crosses himself and repeats his Ave, when the "Corpo Santo," or holy shape appears, to the hardy American or English sailor, who cries out, "Here comes one of these horrid compo-sants." Innumerable are the tales of disaster, and wreck, and death, with which its presence is commented upon, and of which, to their excited imaginations, it is the too certain harbinger. Many a fearful glance is cast aloft, and many a prayer is breathed, that nothing may occur to render their presence there necessary. Men who quailed not from the fiercest fury of the storm, and whose cheeks no certain danger could blanch, have felt their heart suddenly grow faint, and their courage fail, at the sight of this dreaded object. What a benefit would a person confer on these men, who should convince them that in the calm still evenings, they had often with delighted eyes watched this same object, floating by in its native element, clothed in light and beauty; and that it was merely the time and place which made it fearful. It is, in fact, nothing but one of the medusa tribe, which has been blown from the top of some wave, and driven along by the gale till it encountered some obstacle in its progress, to which its numerous long feelers cause it to adhere. It is to be regretted in this, as in many other cases, that those whose information is superior to that of the generality, should consider it beneath their dignity, or at least, unworthy their trouble, to dispel the false notions, and combat the prejudices of the seamen; forgetting that whatever makes men wiser, generally speaking, also makes them better. If the few brief and hasty observations here presented should prove the means of removing the shadows of error or superstition from but one single mind, the writer will much more than have received "his reward." The remarks in this article have been made not without the hope of inducing some abler and better qualified hand to take up the pen, and describe as fully as they deserve, the wonders of "the great and wide sea, wherein are things creeping innumerable, both small and great beasts."

Poverty has in large cities very different appearances. It is often concealed in splendour, and often in extravagance. It is the care of a very great part of mankind to conceal their indigence from the rest. They support themselves by temporary expedients, and every day is lost contriving for to-morrow.—Dr. Johnson.

ELIAS ASHMOLE.

ELIAS ASHMOLE'S HOUSE, LAMBETH.

Elias Ashmole, a philosopher, chemist, and antiquary of some eminence, was born at Litchfield in Staffordshire, May 23rd, 1617, and while yet a boy, understood music so well as to become a chorister in Lichfield Cathedral. When about sixteen he was taken into the house of Mr. Paget, a baron of the Exchequer, where he spent his time in studying the law and some other lighter accomplishments. In March, 1638, he married Miss Eleanor Mainwaring, and in the same year became a solicitor in Chancery. Three years afterwards he became an attorney in the Court of Common Pleas, which was shortly followed by the death of his wife, to whom he was affectionately attached.

When the civil war commenced, his loyal principles made it necessary for him to leave London, and he became a gentleman of the Ordnance in the garrison at Oxford, whence he removed to Winchester, where he filled several situations of more or less importance. In the interim he studied diligently at Oxford, and in the midst of many valuable branches of knowledge, he mixed up a lurking attachment to astrology, which was in great vogue at that time.

When the affairs of the royalists became desperate, Ashmole retired into Cheshire, and subsequently returned again to London, where he became closely connected with Lilly, and other astrologers of the time; but he also bent his mind towards more valuable and rational studies. Being in Buckinghamshire some time afterwards, he formed an acquaintance with Lady Mainwaring, who had been thrice married, and was then for the third time a widow. Ashmole offered his hand to Lady Mainwaring; but her son had such a dislike to the match, that when Ashmole happened to be very ill, he broke into his chamber, and, if not prevented, would have murdered him. However, in November, 1649, they were married, and removed to London, where Ashmole's house became the resort of the most learned and ingenious persons that flourished at that time. He shortly afterwards published a work on alchemy, and likewise a complete collection of the words of such English chemists as had till then remained in MS. He engaged the most eminent engraver of that period, Mr. Vaughan, to engrave the cuts for this work, and employed him in his own house. This work appeared in 1652, under the title of *Theatrum Chymicum Britannicum*, and acquired great reputation for the author as a learned man, and introduced him to several distinguished individuals.

He was then involved in several law-suits, on account of his marriage with Lady Mainwaring, which somewhat distracted his attention from studies; but only for a time, for he directed his attention ardently towards antiquities, losing at the same time a portion of his fondness for astrology and alchemy.

His next undertaking was the collection of materials for a *History of the Order of the Garter*, a work of great labour, as he had to search for and examine documents and records, which had never before been arranged and compared with one another. When he published this work, it was received with an extraordinary degree of attention, not only from the noble and learned in England, but on the continent. Charles the Second gave him 400*l*. The book was deposited by the then pope, in the library at the Vatican. King Christiern, of Denmark, sent him a gold chain and medal, which, with the king's leave, he wore on certain high festivals. Frederick William, elector of Brandenburgh, sent him the like present, and ordered his book to be translated into high Dutch. Other foreign princes likewise testified their high approbation of the work.

About this time Ashmole resided at the house which is represented in our cut, and which was situated at South Lambeth. It formerly belonged to John Tradescant, who had collected a valuable museum. He was a Dutchman, and had travelled to various parts of the world, for the purpose of collecting plants, seeds, minerals, coins, and other rarities. He settled in England, in the reign of James the First, and his museum at Lambeth was visited by all the noble and learned persons of the time. Ashmole first lodged with Tradescant, at the house of the latter, besides having chambers in the temple; but subsequently he became the possessor of the house, and Tradescant made him the noble bequest of his whole museum, in 1659.

In 1661, Ashmole was elected F. R. S., and in the following year was made secretary of Surinam, in the West Indies; and, after filling sundry other offices, he was made Accountant General of the Excise, in 1668. His second wife dying soon after, he married the daughter of the learned Sir William Dugdale, and was in the next year made M. D., by a diploma from Brazen-nose college.

From this period, his learning, and the various offices that he filled, secured him the respect and the society of the principal persons in the kingdom. On one occasion he visited his native town of Lichfield, when the corporation got up a splendid entertainment for the reception of one who now did honour to the place of his birth.

In 1678, Ashmole suffered a great loss, which Anthony à Wood thus describes:—

His chambers in the Middle Temple were burned in the great fire there in January 1678, wherein was a library of books, the collection of thirty-three years, mostly from abroad; a collection of near 9000 coins and medals, ancient and modern, being the gathering of thirty-two years; also a large collection of ancient evidences and seals of the english nobility and gentry; all the great seals of England from the Conquest hitherto, with many of the religious houses both in England and Scotland, those of England hanging at their several instruments. He lost also there his observations upon history, coins, medals, heraldry, and some other subjects, being the effects of his studies for about thirty years, which lay there in his said chambers for improvement as he had leisure. His coins and medals of silver were all melted, and have cost him as much as the worth of them in weight, in digging among the ruins, sifting among the rubbish, and hiring the silversmiths to wash the dirt.

About the same period he made a present of the whole of his museum to the university of Oxford, and thus originated the celebrated Ashmolean Museum at that place. It was towards the latter end of October, 1677, that he made an offer to that university, of bestowing

on it all that valuable collection of the Tradescants, which was so well known to the learned world, and which had been exceedingly improved since it came into his possession, together with all the coins, medals, and manuscripts, of his own collecting, provided they would erect a building fit to receive them: to which proposition the university willingly assented. Accordingly, on Thursday, May 16th, 1679, the first stone of that stately fabric, afterwards called Ashmole's Museum, was laid, on the west side of the theatre; and being finished by the beginning of March, 1682, the collection was deposited, and the articles arranged by Dr Plot, who had before been intrusted with their custody. This museum was first publicly viewed on the 21st May following, by his Royal Highness James, Duke of York, his royal consort Josepha Maria, Princess Anne, and their attendants, and on the 24th of the same month, by the doctors and masters of the university. In a convocation, held in June, a Latin letter of thanks, written by the deputy orator, being publicly read, was sent to Mr. Ashmole, at South Lambeth. It has been remarked that Tradescant was deprived of his due share of honour, with regard to this collection; for it is Ashmole, and not Tradescant, whose name is attached to the museum.

Soon after this period, Ashmole retired from all the various offices which he had filled, and lived in dignified retirement, respected and admired by all, and offering a fostering hand to many who had not the pecuniary means necessary for developing the powers which they possessed. He died, May 18, 1692, in his seventy-sixth year, bequeathing his library, and other valuable articles, to the university of Oxford.

THE GROTTO OF ANTIPAROS*.

ONE of the most remarkable curiosities in the world is the Grotto of Antiparos, situated among the Greek islands, that scene of so much that is interesting to the scholar, the poet, and the antiquary.

Antiparos is one of the small islands in the Grecian Archipelago, and is situated exactly opposite to the isle of Paros, a circumstance indicated by its name. It is of an oblong shape, and about sixteen miles in circumference. There is a tolerably large village about the middle of the island, and at a small distance from the sea. The entrance to the grotto is near the summit of one of the highest hills. Having arrived at a large area, which appears as if it had been hewn out of a rock, the traveller sees before him a perpendicular face or wall, from fifteen to twenty feet high, and nearly filled with columns of stalactite. Behind these columns a passage leads to an opening through which the traveller enters, and after descending obliquely, he comes to a perpendicular descent. The mode of descent is by ropes, which on the different declivities are either held by natives, or they are joined by a cable which is fastened at the entrance around one of the stalactitic pillars. When the traveller has been let down by a rope through the perpendicular descent, another sloping path leads to another perpendicular descent. When the latter is descended, the traveller lands upon a small projection of the rock which affords footing enough to enable him, by clinging to the side of the cavern, to pass round into the principal chamber, the floor of which is tolerably level.

This chamber, cavern, or grotto, is of surpassing magnificence, and rivets the attention of the traveller. It measures upwards of two hundred and fifty feet in one direction, and three hundred in another. The roof, the floor, and the sides are entirely invested with a dazzling incrustation as white as snow. Columns, some of them twenty-five feet in length, hang like icicles from the roof; "fortunately," as Dr. Clarke observes, with just satire, "some of them are so far above the reach of the numerous travellers who, during many ages, have visited this place, that no one has been able to injure or remove them." Other columns extend from the roof to the floor, with diameters equal to that of the mast of a first-rate ship of the line. The loftiest part of the chamber is of considerable height. There is a large mass of stalactite which divides the principal chamber from the adjoining one, and which is remarkable for the lightness and variety of its tapering columns with round embossed heads, giving the place, when well lighted up, very much the appearance of a Gothic cathedral.

The mass of white stalactite, which we have described as dividing one chamber from another, has received the name of the *Altar*, from a remarkable ceremony which was performed there many years ago. The Marquis de Nointel, ambassador from Louis the Fourteenth of France to the Grand Seignior, happening to pass through the Archipelago about the season of Christmas, 1673, determined to celebrate the festival within the grotto itself. He caused it to be illuminated by one hundred large flambeaux, and four thousand lamps, which, when reflected from the white sparry crystal, must have almost exceeded in brilliancy anything that the eye ever yet witnessed. More than five hundred persons attended on this occasion, and the celebration of midnight mass (the ambassador being a Roman Catholic) was recorded in an inscription still visible on a neighbouring rock.

Magni, the traveller who first describes this grotto, gives a vivid picture of the feelings which the sight of it occasioned. He says,—

Having been informed by the natives of Paros, that in the little island of Antiparos, a gigantic statue was to be seen at the mouth of a cavern at that place, I was resolved to pay a visit to it. In pursuance of this resolution, after we had landed on the island, and walked about four miles through beautiful plains and woodlands, we at length came to a little hill, on the side of which yawned a most horrid cavern, that with its gloom at first struck us with terror, and almost repressed our curiosity. Recovering from our first surprise, however, we entered boldly, and had not proceeded above twenty paces when the supposed statue of the giant presented itself to our view. We quickly perceived, that what the ignorant natives called a giant, was nothing more than a sparry concretion, formed by the water dripping from the roof of the cave, and by degrees hardening into a figure that their fears had transformed into a monster. Incited by this extraordinary appearance, we proceeded still further, in quest of new adventures in this subterranean abode. As we advanced, new wonders offered themselves; the spars, formed into trees and shrubs, presented a kind of petrified grove, some white, some green, and all receding in due perspective. They struck us with the more amazement, as we knew them to be the mere productions of nature, who, hitherto in solitude, had in her playful moments dressed out the scene for her own amusement. But we had as yet seen but few of the wonders of the place, and we were introduced as yet into only the portico of this amazing temple. In one corner of this half-illuminated recess, there appeared an opening of about three feet wide, which seemed to lead to a place totally dark, which one of the natives assured us contained only a reservoir of water. Upon this we tried, by throwing down some stones, which rumbling along the sides of the descent for some time, the sound seemed at length quashed in a bed of water. In order, however, to be more certain, we sent in a Levantine mariner, who, by the promise of a good reward, with a flambeau in his hand, ventured into this narrow aperture. After continuing in it for about a quarter of an hour, he

* The reader will find a view of this Grotto in *Saturday Magazine*, Vol. II., p. 73, a reference to which will enable him better to understand the additional particulars contained in the present article.

returned, carrying some beautiful pieces of white spar in his hand, which art could neither imitate nor equal.

It may naturally be supposed that this excited the traveller's curiosity still further. The whole party ventured through the opening, each one carrying a flambeau, and all followed one another into the grand chamber. Here their attention was at once absorbed by the glittering spectacle presented to them. The roof all hung with icicles, transparent as glass, yet solid as marble,—the lofty and noble ceiling,—the sides covered with spars,—the masses assuming the forms of columns, thrones, altars, &c., formed altogether a scene which might well leave a deep impression on the mind of the traveller.

Tournefort, in his *Voyage to the Levant*, gives rather an unfavourable account of the mode and the means of getting entrance to the grotto, beautiful as the grotto itself is. He says,—

You afterwards go forward to the bottom of the cavern by a greater descent of about twenty paces long; this is the passage into the grotto, and this passage is only a very dark hole, in which you cannot walk upright, nor without the help of torches. First, you go down a frightful precipice by means of a rope, which you take care to fasten at the very entrance. From the bottom of this precipice you slide down into another much more terrible, the sides very slippery, and deep abysses on the left hand. They place a ladder aside of these abysses, and by its means we tremblingly got down a rock that was perfectly perpendicular. We continued to make our way through places somewhat less dangerous; but when we thought ourselves upon sure ground, the most frightful leap of all stopped us short, and we had infallibly broken our necks, had we not had notice and been kept back by our guides. There is still the remains of a ladder which M. de Nointel had placed there; but as it is now grown rotten, our guides had taken care to bring another brand-new. To get down here, we were forced to slide upon our backs along a great rock; and without the assistance of another rope, we had fallen down into horrible quagmires. When we were come to the bottom of the ladder, we again rolled for some time over rocks, sometimes on our backs, sometimes on our bellies, according as we found most ease. And after all these fatigues, we at length entered into that admirable grotto, which M. de Nointel had just reason to say he could never sufficiently admire.

Another traveller, after having got through about half the difficulties of the descent, thus expresses his woe:—

If I had heartily repented of my expedition before, here I was all in a cold sweat, and fairly gave myself over for lost; heartily cursing all the travellers who had visited this place, that they had described it so as to tempt people to see it; and never told us of the horrors that lay in the way. In the midst of these reflections, and in the very dismalest part of the cavern, on a sudden we had lost four of our six guides. What was my terror on this occasion! The place was a thousand times darker and more terrible for want of their torches; and I expected no other but every moment to follow them into some of these lakes, into which I doubted not but they were fallen. The remaining two guides said all they could, indeed, to cheer us up, and told us that we should see the other four again soon, and that we were near the end of our journey. I do not know what effect this might have upon the rest of my companions, but I believed no part of the speech but the last, which I expected every moment to find fulfilled in some pond or precipice. Our passage was by this time become very narrow, and we were obliged to crawl on all fours over rugged rocks; when in an instant, and in the midst of these melancholy apprehensions, I heard a little hissing noise, and found myself in utter and indescribable darkness. Our guides called indeed cheerfully to us, and told us that they had accidentally dropped their torches into a puddle of water; but that we should come to the rest of them, and they would light them again; and told us there was no danger, and that we had nothing to do but to crawl forward. I determined to lie down and die where I was. One of our guides, perceiving that I did not advance, came up to me, and, clapping his hands firmly over my eyes, dragged me a few paces forward.

The sequel is soon told. This traveller was rather too much of a coward for the exploit he had undertaken; so the guide blinded his eyes, and pulled him onwards to the grotto; then, uncovering the traveller's eyes again, the splendour of the grotto burst upon his view, and made him forget his mishaps in the transport that he felt.

But what is the origin of this crystal grotto? To this question we must devote a short space. Supposing the cavern itself to be one of those natural cavities which exist so abundantly in every part of the world, the crystalline deposit has been well accounted for by M. de Choisèul. The water which oozes through fissures in the rock, carries with it, in a state of solution, innumerable particles of calcareous matter; and when it finally escapes, in the form of drops, at the roof and sides of the cavern, the calcareous matter held in solution remains, and forms a concretion, while the water evaporates. The nucleus thus formed is continually receiving an additional coat, from fresh moisture descending as before. Like icicles hanging from rocks washed by a torrent, the stalactites grow larger and larger, still preserving the conical figure occasioned by their original mode of formation. But should the water filtrate in greater abundance from above, the drops will not have time to evaporate in their passage; they will therefore fall to the bottom of the cavern, and will there occasion calcareous concretions, extending upwards, in proportion as those from the roof extend downwards; so that in process of time their extremities will meet. Thus will a column be formed, imperfect at first, but gradually enlarging, from the same causes as first gave it birth. Such is the manner in which Choisèul accounts for the formation of the columns, and other fantastically formed masses, which are visible on every hand, as well as for the icicles hanging from the roof.

Dr. Clarke, who was a mineralogist as well as an indefatigable traveller, says that the upper surface, or summit of the mountain, is a stratum of lime-stone, inclined very considerably from the horizon; beneath this is a layer of schistus, containing the sort of marble called *cipolino:* then occurs the cavity which forms the grotto, parallel to the dipping inclination of the superior strata, and this cavity was once probably occupied by a bed of marble, succeeding in regular order to the schistus above it.

The stalactite which forms the beautiful sparry concretion of the grotto, is pure alabaster, and the known delicacy of that substance will help to furnish an idea of the dazzling richness which the grotto presents. There are two kinds of Alabaster; viz., *carbonate of lime*, of which the ancients used to make their perfume boxes and vases, and of which the Grotto of Antiparos consists; and *sulphate of lime*, which is commonly known among us by the name of *gypsum*. Carbonic acid is very frequently present in water; and when a superabundance of it is present, the fluid is capable of maintaining in solution a portion of carbonate of lime; but upon the slightest agitation, or division, or exposure to the atmospheric air, or change of temperature, the carbonic acid makes its escape, and the fluid, thus losing its solvent power, allows the lime to precipitate.

Dr. Clarke mentions it as remarkable, that these enormous stalactites, thus formed during a series of ages by the slow and gradual deposit of carbonate of lime, filtering drop by drop from the roof of the cavern, offer concentric layers only towards their surfaces; their interior structure exhibiting a completed crystallization, which separates by fracture into semi-transparent rhombs, as perfectly formed as if they

had resulted from a simultaneous, instead of a continued, process. Dr. Clarke saw, what he believes himself to have been the first who ever saw, the crystallization of alabaster. These crystals were in distinct groups on the surfaces of several of the concretions in the grotto. That these crystals were gradually accumulating in size, until they met together and constituted one mass, he conceived to be evident, because, upon a diligent examination of all parts of the grotto, he found, that where the stalactites are small, and in an incipient state, the crystals upon their surface were exceedingly minute; where they were large, the crystals were also large, some of them exceeding two inches in diameter. Another surprising circumstance is, that although the outer crust of these crystals is opaque, and similar to the exterior incrustation of the concretions themselves, the crystals, when broken, are, each and all of them, found to be parts of the stalactites upon which they have been formed.

Altogether this exquisite natural grotto affords an interesting and valuable occupation for the labour of the mineralogist, as well as pleasure to the travellers who visit it from curiosity.

RISE AND PROGRESS OF THE SILK MANUFACTURE.

III.

IMPROVEMENTS IN MACHINERY.

THE Throwing-mills and machinery, (already referred to), erected by Messrs. Lombe at Derby, in 1718, were the objects of the greatest admiration at the time, but have long since become obsolete, by improvements subsequently made; but in Italy they remain unchanged. Raw silk, before it can be used in weaving, must be converted by throwing into either singles, tram, or organzine. Singles is the most simple process, consisting in merely twisting the raw silk, in order to give it a firmer texture. Tram is formed by twisting together, not very closely, two or more threads, and this description most commonly forms the shoot in manufactured goods. Organzine is principally used in the work that is to form the length of the goods.

The throwing is of the nature of rope-making, where the combined strands are twisted in an opposite direction to that given to the separate threads: whereas singles and tram are twisted only in one direction, similar to twine. The thrown silk is first dyed, and that intended to form the warp, is prepared by a warper, by means of a warping-mill.

Plain-weaving.—The machine for enabling the weaver to perform his labours, has, up to very recent times, been the object of but little change or improvement. The art of weaving varies but little, whatever may be the material which is the subject of manufacture. The engine-loom is chiefly used at Coventry, also in Spitalfields. Coventry has long been the seat of the ribbon manufacture of England, employing above 10,000 looms.

Figure-weaving.—The Jacquard loom has driven other looms out of use. It was the invention of M. Jacquard, a weaver of Lyons, bearing his name. It will prove a lasting record of his mechanical talent. The elaborate specimens of brocade, which used to be brought forward as evidence of skilfulness on the part of weavers of former days, were produced by only the most skilful of the craft, who bestowed on their performance the most painful amount of labour. The most beautiful products of the loom in the present day are, however, accomplished by men possessing only the ordinary rate of skill, while the labour attendant upon the actual weaving is but little more than that demanded for making the plainest goods. In the course of the very few years during which the Jacquard loom has been known in England, it has been materially simplified and improved; while in Lyons, the city of its birth, it still remains unaltered, either in form or arrangement, from the original conception of its ingenious inventor.

Dr. Cartwright, during the summer of 1784, had his attention directed to weaving, and in a short time produced his first power-loom, which, though an extremely rude machine, soon received many valuable improvements; but his mill, containing five hundred looms, was wilfully burnt down in 1813. There were 2300 power-looms in the United Kingdom. Dr. Cartwright expended from 30,000*l.* to 40,000*l.*, and was compelled to abandon his manufactory. In 1808 he presented a petition to the House of Commons, and 10,000*l.* was granted, as some compensation for his outlay and disappointment.

Power-looms are more and more applied to the production of broad silks and ribbons, and will eventually drive the engine-loom out of use. It has already caused a considerable want of employment in Spitalfields. The silk-trade of Great Britain at present may be valued at 7,000,000*l.*; the importations from France through the custom-house about 500,000*l.*, and by smuggling to about 300,000*l.*; making together 800,000*l.*

The imperishable nature of silk, even under circumstances peculiarly unfavourable to the preservation of animal substances, forms one of its qualities, which is deserving of remark. Some years ago, the sexton of the parish of Falkirk, in Stirlingshire, upon opening a grave in the church-yard, found a ribbon, wrapped round the bone of an arm, and which, being washed, was found entire, and to have suffered no injury, although it had lain there more than eight years, and had been in contact with a body, which had passed through every stage of putrefaction, until it was reduced to its kindred dust.

INGENUITY OF A SPIDER.

A LARGE blue fly having got his legs entangled in a web, set up a terrible buzzing with its wings, but could not extricate its pinioned members. A little spider stood watching the prisoner at a distance of two inches, on a slender thread of its own weaving. As soon as the poor fly had become weary, so that its wings were still, the little assassin crept so near, that with its right hand it fastened a line on one wing, and then scampered off to the wall to make it fast. The fly, thus alarmed, again began to buz as furiously as before; but the spider never ventured near till the wings were quiet, when it cautiously crept near enough again to throw a second cord over the wing, which was fastened, as in the first instance, to the ceiling. Thus, by little and little, and patiently waiting for opportunities, both wings were completely bound down with those almost invisible lines. Being conscious that the fly was now completely within its power, the cruel spider boldly seized upon the body of its captive, to feed leisurely upon its vitals; but a spectator, overcome by his sympathies for the wretched insect, crushed the spider into an impalpable powder. He now attempted the liberation of the fly; in doing which he not only tore off several of its legs, but so injured the membrane of the wings as to render a repair impossible. His compassion obliged him to kill the poor fly also.

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